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Applicant(s): SCHILLER, Richard Serial No. / Patent No. 10/798,778 Title: VIDEO DISPLAY DEVICE		EPLC Docket No.: P-6666-US Hand Delivered on: 7 June 2004
1. <input type="checkbox"/> Provisional Cover Sheet 2. <input type="checkbox"/> Design Patent Application Transmittal 3. <input type="checkbox"/> RCE Transmittal Sheet 4. <input type="checkbox"/> Transmittal Sheet for Entering National Phase 5. <input type="checkbox"/> Fee Transmittal Sheet 6. <input type="checkbox"/> Patent Application Under 35 USC 111(a) <input type="checkbox"/> Provisional Patent Application Under 35 USC 111(b)	10. <input type="checkbox"/> Response to Notice to File Missing Parts 11. <input type="checkbox"/> Response to Notice of Incomplete Reply 12. <input type="checkbox"/> Request for Correction of Filing Receipt 13. <input type="checkbox"/> Information Disclosure Statement including Form PTO 1449 and reference 14. <input type="checkbox"/> Preliminary Amendment 15. <input type="checkbox"/> Response to Office Action dated	
Containing: _____ pages of Specification _____ pages of Claims _____ page of Abstract  _____ pages of Formal Drawings _____ pages of _____	16. <input type="checkbox"/> Petition for a Three Month(s) Extension of Time 17. <input type="checkbox"/> Notice of Appeal <input type="checkbox"/> Appeal Brief 18. <input type="checkbox"/> Issue Fee Transmittal <input type="checkbox"/> Publication fee 19. <input type="checkbox"/> Submission of Formal Drawings: Two sets of Sheets containing Figs.	
7. <input type="checkbox"/> Signed declaration and Power of Attorney 8. <input type="checkbox"/> Recordation of Assignment Cover Sheet & Signed Assignment 9. <input type="checkbox"/> Request for Correction of Recordation of Assign. and: -Recordation Cover Sheet -Copy of Notice of Recordation of Assign.	20. <input checked="" type="checkbox"/> Certified Copy of Priority Doc. 21. <input type="checkbox"/> Claim for Priority under 35 U.S.C. Section 119 22. <input type="checkbox"/> Revocation and Power of Attorney, including: -- Statement Under 37 CFR 3.73(b) -- Copy of Assignment 23. <input type="checkbox"/> Other:	
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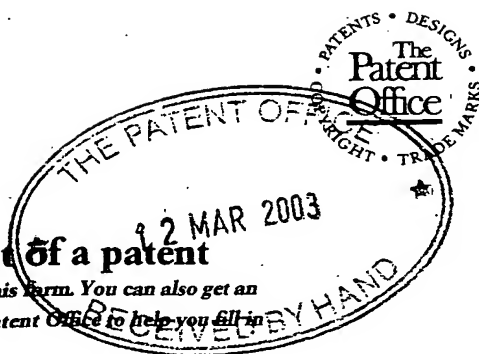
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1/77  
13MAR03 0791052-1 002000  
P01/7700 0.00-0305678.5

# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road  
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1. Your reference

PDG/25393GB

2. Patent application number

(The Patent Office will fill in this part)

0305678.5

12 MAR 2003

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Snell & Wilcox Limited  
6 Old Lodge Place  
St Margaret's  
Twickenham  
Middlesex TW1 1RQ United Kingdom

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

557978 4003

4. Title of the invention

Video Display Device

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

MATHYS & SQUIRE  
100 Gray's Inn Road  
London WC1X 8AL  
United Kingdom

Patents ADP number (if you know it)

1081001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)

Date of filing  
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body.
- See note (d))

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Description 5

Claim(s) 2

Abstract -

Drawing(s) 5 + 5 RM

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Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*) 1

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature   
MATHYS & SQUIRE

Date 11 March 2003

12. Name and daytime telephone number of person to contact in the United Kingdom  
Peter D. GARRATT - 020 7830 0000

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# VIDEO DISPLAY DEVICE

This invention is directed to the display of information associated with a television picture.

In television control rooms where technical and/or production staff need to view a number of picture monitors, for example the inputs and outputs of a vision mixer, it is common practice to provide a text display underneath each picture monitor so as to identify the signal being displayed. The display is typically a label describing the picture material, the name of the signal source or some other "tag" to identify the signal. It can also be used to display the status of the signal or other pertinent information. In production control rooms camera operator's names are often displayed so that the producer can address instructions to a particular operator over a common talkback channel.

Typical under monitor displays consist of a rectangular box having the same width as the picture monitor with an LED array on the front face to display text. Often some other indicators such as red on-air lights are provided. There may be one box below each monitor, or a box with two displays may be fitted between two monitors. They are typically 1 rack unit (1 ¾ inches) high and 19" wide so that they fit neatly into a standard bay-frame used to mount the monitors.

Space is usually at a premium in control rooms and there is a conflict between the need to provide displayed information and the need to fit in as many monitors as possible. Under monitor displays also need power supplies and generate heat. They also add to the cost of the installation.

The invention consists, in one aspect, of a method of displaying a video signal together with associated information, wherein the video is transformed from a first scanning raster to a second scanning raster having a different aspect ratio from the first, the transformation providing compensation for the aspect ratio change, and the transformed video occupies only part of the second scanning raster; characterised in that some or all of unoccupied part of the second raster is used to display the associated information.

The inventor has appreciated that a novel solution to the problem of providing space for under monitor displays is made possible by the trend towards wide-screen television production.

Historically television pictures had an aspect ratio (width to height ratio) of 4:3. Modern program production is making increasing use of the wider 16:9 ratio; and high definition television uses this ratio exclusively. Picture monitors, especially "standard definition" monitors, are made with displays of both these aspect ratios and "aspect ratio converters" which geometrically transform pictures to compensate for display on the "wrong" display shape are well-known. This conversion may be done in such a way that some picture information is not shown, or so that part of the display area is not used, or a combination of the two.

In another aspect the invention consists in a method of displaying a video signal together with associated information, wherein the video is transformed from a first scanning raster to a second scanning raster having a different aspect ratio from the first, the transformation providing compensation for the aspect ratio change, and the transformed video occupies only part of the second scanning raster; characterised in that a display device for the associated information obscures some or all of the unoccupied part of the second raster at a display device.

Suitably, the first raster has a 16:9 aspect ratio and the second raster has a 4:3 aspect ratio.

Alternatively, the first raster has a 4:3 aspect ratio and the second raster has a 16:9 aspect ratio.

Advantageously, the first raster is a high-definition raster and the second raster is a standard definition raster.

In a further aspect the invention consists of down conversion apparatus for converting a high definition video signal into a standard definition video signal characterised in that the converted picture does not occupy the whole of the output scanning raster, and all or part of the unoccupied raster is used to display information associated with the video signal.



Advantageously, the apparatus is provided with a control input for changing the displayed information.

In a further aspect the invention consists in a display device for displaying information associated with an aspect ratio converted video signal, where the converted signal does not fill the entire frame, intended to be placed in front of a video display characterised in that at least one eighth of the said video display's display area is obscured.

In a yet further aspect, the invention provides apparatus for displaying a video signal with associated information, comprising a first input for receiving a video signal, a second input for receiving a data signal, means for converting the video from a first scanning raster to a second scanning raster having an aspect ratio different from the first such that the video occupies a first part of the second raster, and means for displaying the data in a second part of the second raster unoccupied by the video.

Examples of the invention will now be described with reference to the drawings in which:

Figure 1 shows a block diagram of a video processor according to an embodiment of the invention;

Figures 2 and 3 show the results of two different aspect ratio conversion processes;

Figures 4 and 5 show the appearance of two different video displays in accordance with embodiments of the invention; and

Figure 6 shows an alternative embodiment of the invention.

Referring to Figure 1, a video input signal (1) is input to an aspect ratio converter (2). This converter transforms the shape of the input picture to make it suitable for display on a display device having an aspect ratio which differs from

that intended for the input signal (1). The transformation is done in such a way that some part of the output frame is not used. Two examples of such transformations are shown in Figures 2 and 3, which show how an input is fitted into a display area without introducing geometric distortion.

5        Figure 2 shows a 4:3 display (20) of a 16:9 input picture (21) where the input picture is placed at the top of the display leaving an unused space (22).

Figure 3 shows a 16:9 display (30) of a 4:3 picture (31) where the input picture is placed at the right hand side of the display leaving an unused space (32).

10        Returning to Figure 1, the aspect ratio converter (2) has two outputs: the converted video signal (3), and a key signal (4). The video signal (3) is passed to one input of a split-screen-switch (5), which is controlled by the key signal (4). A second video input (6) of the split-screen-switch (5) is fed from a caption generator (7).

15        The aspect ratio converter (2) controls the split screen switch via the key signal (4) so that its output video signal (8) comprises the video signal (3) during those parts of the active picture raster corresponding to the transformed video signal, and comprises the output (6) of the caption generator (7) during the remaining, unused, active picture raster.

20        The caption generator (7) is pre-programmed in known manner so as to provide text and graphical information associated with the video signal (1), formatted so as to coincide with the unused parts of the transformed video signal (3). A data input (9) controls the displayed text and graphics in real time; for example to operate red on-air symbols when the video signal (1) is selected for  
25        transmission. Two examples of how the output video signal (8) might appear are shown in Figures 4 and 5.

Figure 4 shows a 4:3 display (40) where the space (41) beneath a 16:9 picture area (42) is used to show related text (43) and "on-air" indicators (44) and (45).

30        Figure 5 shows a 16:9 display (50) where the space (51) beside a 4:3 picture area (52) is used to show related text (53).

This concept can be applied in a number of ways. For example in high definition production the signal may be down-converted to standard definition for monitoring purposes, so as to enable cheaper, standard definition picture monitors to be used. It is common for down converters to include aspect ratio conversion, and the invention can therefore be embodied in such a down converter.

Conversion of video to computer scan formats also can involve aspect ratio conversion and so the invention can be embodied in a "video to computer" converter, or a display upconverter.

10 A further embodiment of the invention is shown in Figure 6. In this case the text and graphics are not combined with the video signal but are displayed on a conventional display device, such as an array of light-emitting-diodes, which is adapted to fit in front of a picture monitor covering part of the monitor's display area.

15 Referring to Figure 6, a picture monitor, or other video display device, (61) has a 4:3 display area which is partially covered by a display panel (62). The part which is not obscured (63) has an aspect ratio of 16:9. The remaining 16:3 area (64) is hidden behind the display panel (62).

20 The monitor is fed with a video signal which comprises a 16:9 aspect ratio picture occupying the upper part of the display screen. The display panel (63) is used to display information associated with the video signal. It can, if necessary, be larger than the unused part (64) of the video display; provided it does not obscure the display area corresponding to the 16:9 picture.

25 It will be appreciated by those skilled in the art that the invention has been described by way of example only, and that a variety of alternative approaches may be adopted without departing from the scope of the claims.

## CLAIMS

5 1. A method of displaying a video signal together with associated information, wherein the video is transformed from a first scanning raster to a second scanning raster having a different aspect ratio from the first, the transformation providing compensation for the aspect ratio change, and the transformed video occupies only part of the second scanning raster; characterised in that some or all of unoccupied part of the second raster is used to display the associated information.

10

2. A method of displaying a video signal together with associated information, wherein the video is transformed from a first scanning raster to a second scanning raster having a different aspect ratio from the first, the transformation providing compensation for the aspect ratio change, and the transformed video occupies only part of the second scanning raster; characterised in that a display device for the associated information obscures some or all of the unoccupied part of the second raster at a display device.

15

20 3. A method according to Claim 1 or Claim 2 where the first raster has a 16:9 aspect ratio and the second raster has a 4:3 aspect ratio.

4. A method according to Claim 1 or Claim 2 where the first raster has a 4:3 aspect ratio and the second raster has a 16:9 aspect ratio.

25

5. A method according to any of the preceding claims in which the first raster is a high-definition raster and the second raster is a standard definition raster.

30

6. Downconversion apparatus for converting a high definition video signal into a standard definition video signal characterised in that the

converted picture does not occupy the whole of the output scanning raster, and all or part of the unoccupied raster is used to display information associated with the video signal.

5

7. Apparatus according to Claim 6 provided with a control input for changing the displayed information.

10

8. A display device for displaying information associated with an aspect ratio converted video signal, where the converted signal does not fill the entire frame, intended to be placed in front of a video display characterised in that at least one eighth of the said video display's display area is obscured.

15

9. Apparatus for displaying a video signal with associated information, comprising a first input for receiving a video signal, a second input for receiving a data signal, means for converting the video from a first scanning raster to a second scanning raster having an aspect ratio different from the first such that the video occupies a first part of the second raster, and means for displaying the data in a second part of the

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second raster unoccupied by the video.

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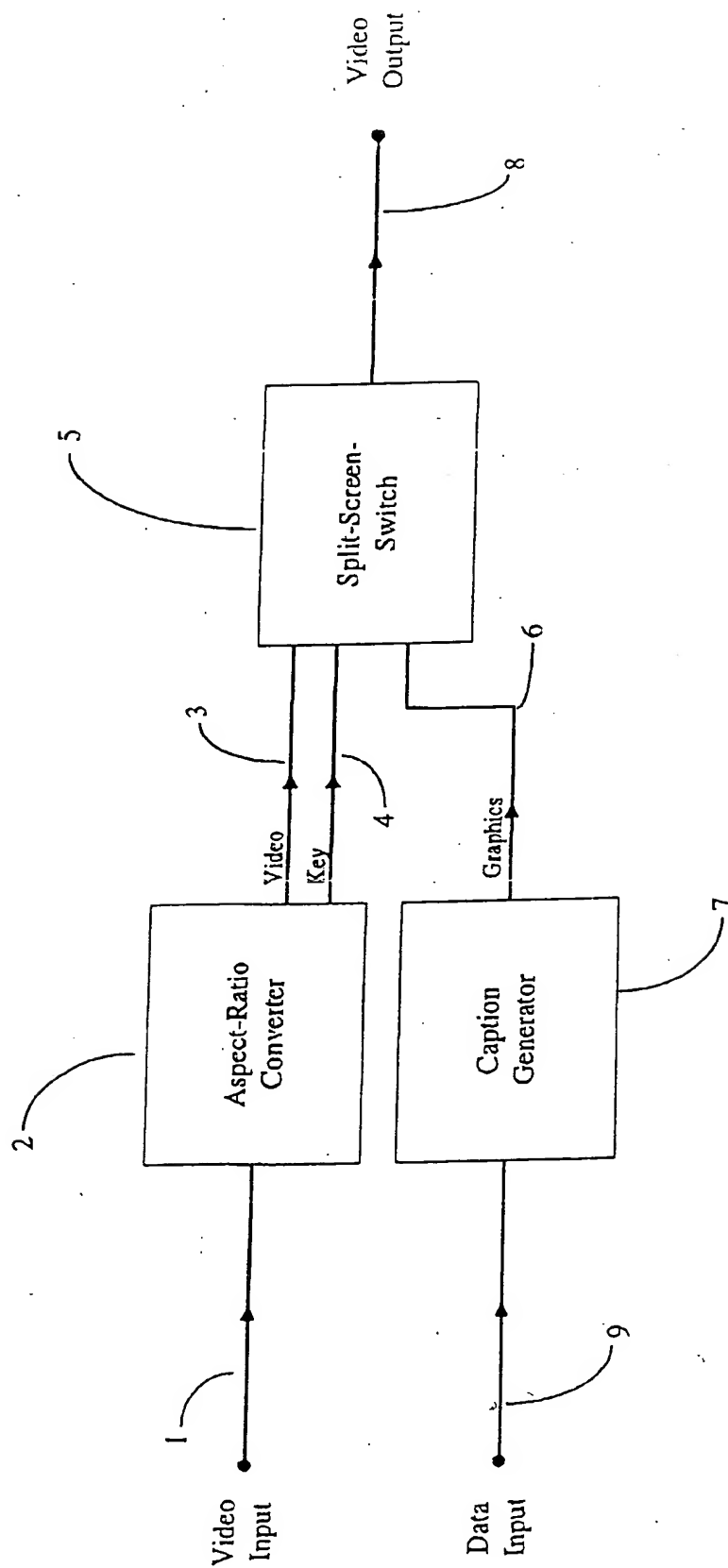


Figure 1: Video and Data Combiner

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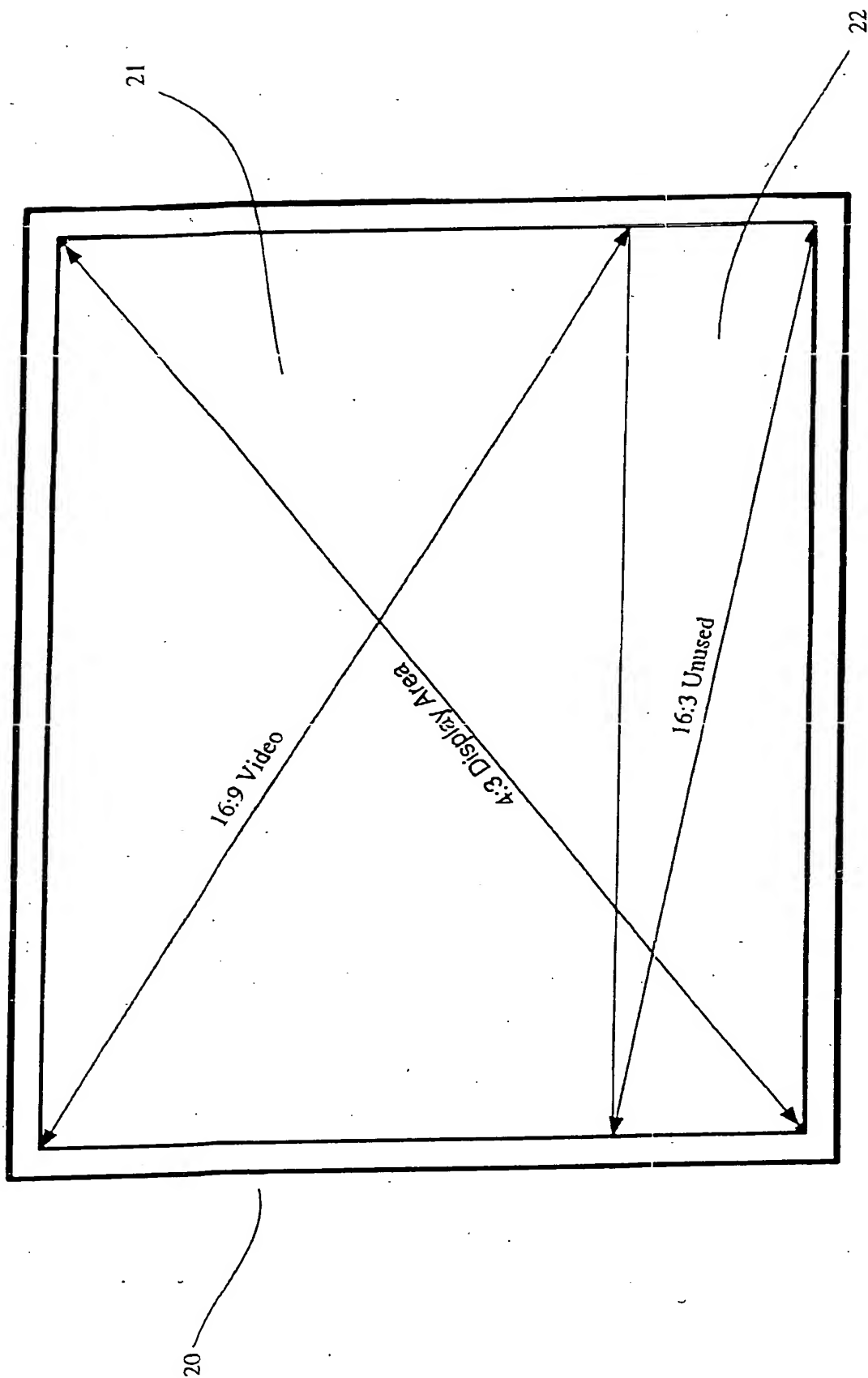


Figure 2: Wide-Screen Video Displayed on 4:3 Display

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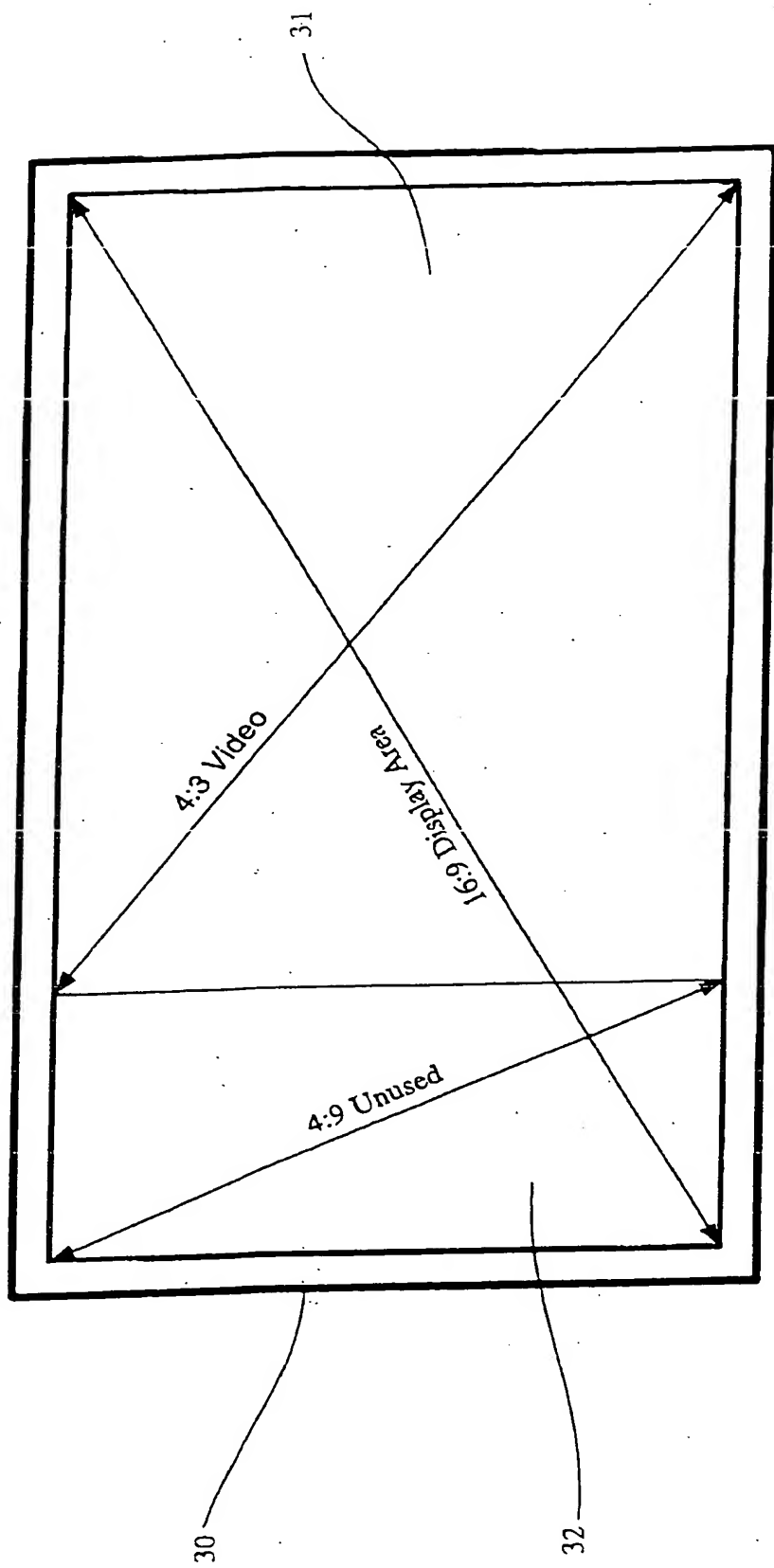


Figure 3: 4:3 Video Displayed on Wide-Screen Display

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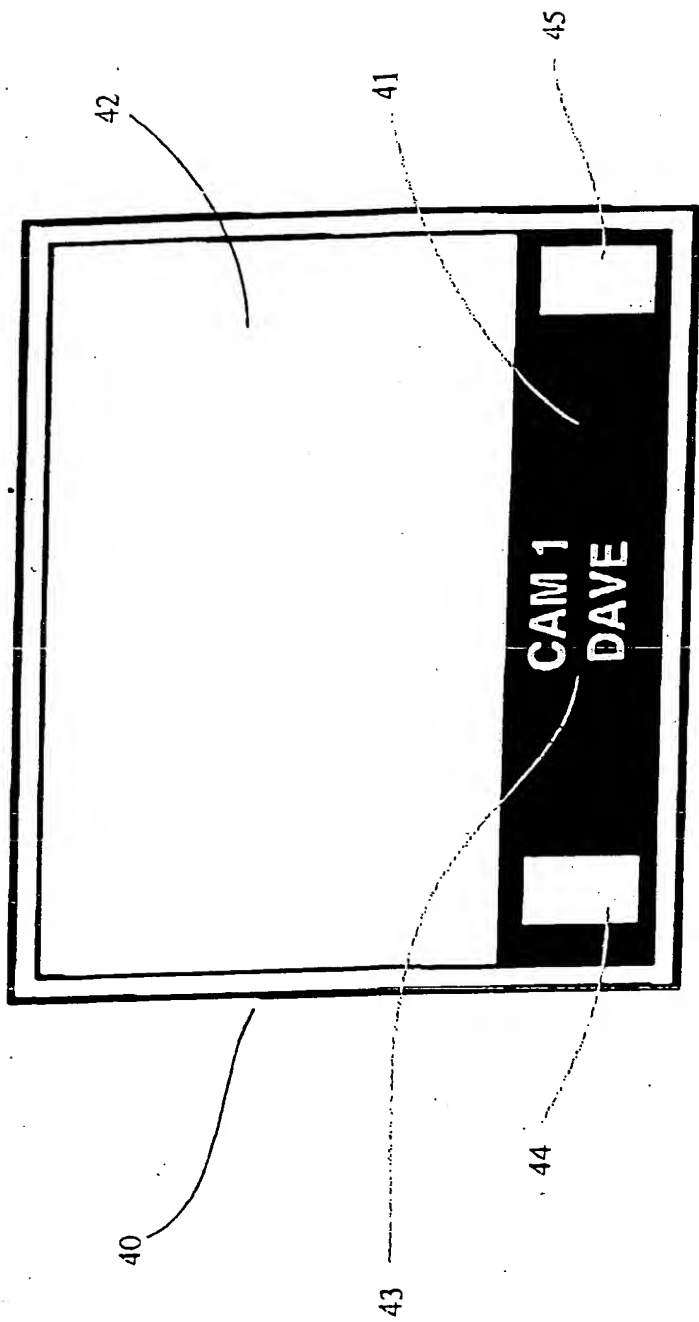


Figure 4: Under Picture Display

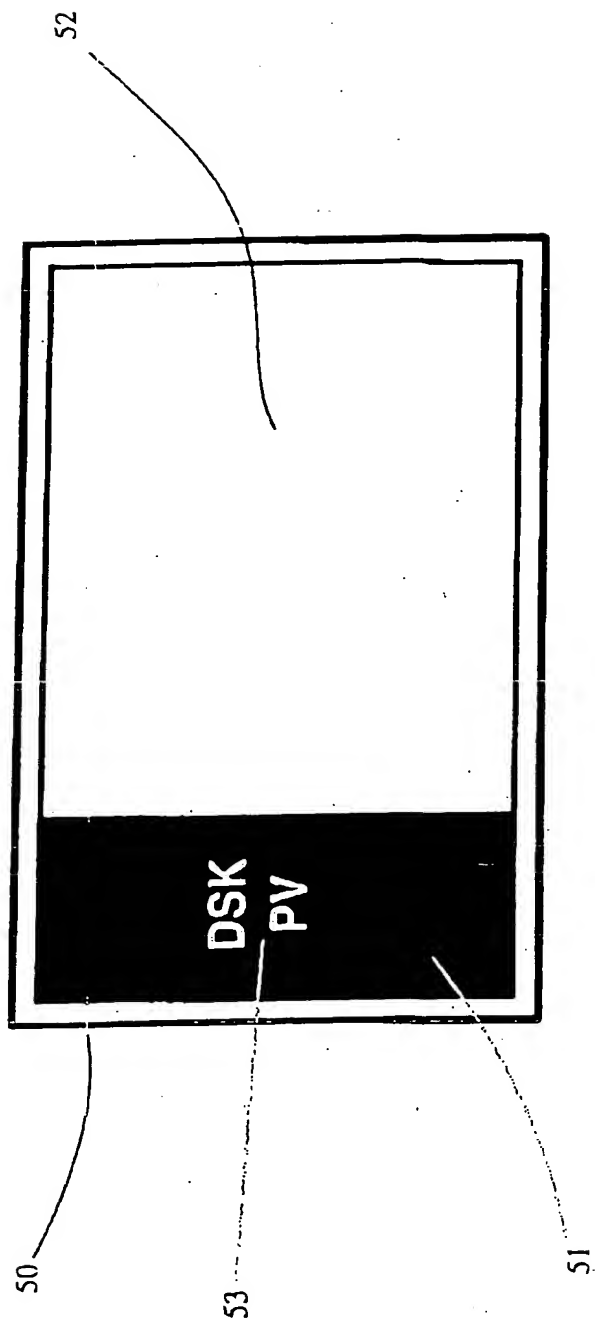


Figure 5: Beside Picture Display

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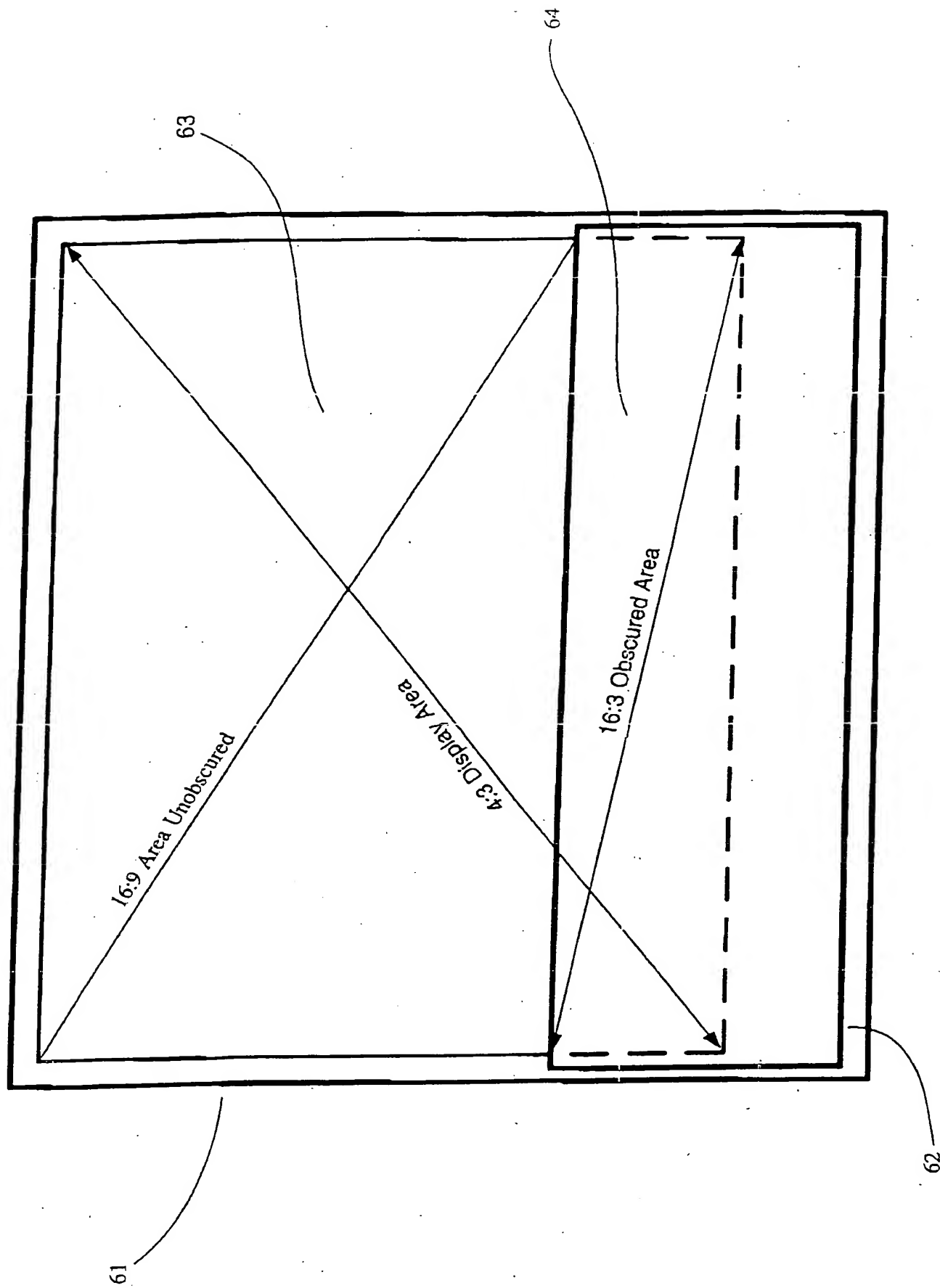


Figure 6: 4:3 Display Partially Obscured by Second Display Device

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